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Cross-coupling of Tetrahedratic Order

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We discuss how tetrahedratic order couples to external fields, forces and other variables [1-4]. In particular, we show that the application of an external electric field to a tetrahedratic phase induces quadrupolar orientational order, thus inducing a nematic phase in a field. We discuss a linear gradient term coupling tetrahedratic and quadrupolar order and show that this term could explain the ambidextrous chiral domains observed in nematic phases formed by achiral banana-shaped molecules.

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